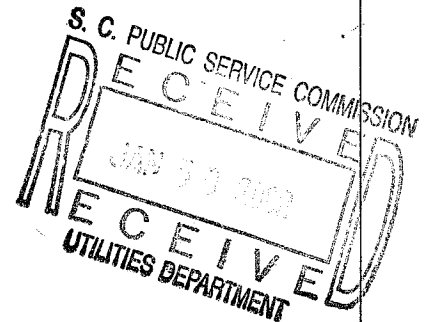# Application of <u>United Utility Companies, Inc.</u> for approval of a new schedule of rates and charges for water and sewer service in its certificated service areas in South Carolina.

Docket No. 2000-210-W/S

Testimony of
James E. Spearman
Research Department

Public Service Commission of South Carolina

1   **Q   Please state for the record your name, business address and position**

2   **with the Public Service Commission of South Carolina.**

3   A   My name is James E. Spearman. My business address is 101 Executive

4   Center Drive, Columbia, SC. I am employed by the Public Service Commission

5   of South Carolina as Research & Planning Administrator.

6   **Q   Please summarize your educational background and professional**

7   **experience.**

8   A   I graduated from Pennsylvania State University with a Bachelor of

9   Science in Mineral Economics and from the Darden School of the University of

10 Virginia with a Master of Business Administration. I received a Doctor of

11 Philosophy in Resource Economics from West Virginia University with

12 specialization areas in Regional Economics and Trade and Development.

13   My professional experience includes being a faculty member at the

14 University of South Carolina-Lancaster and Erskine College where I taught a

15 variety of economics and business courses. I also taught economics courses as

16 an adjunct professor in the Graduate Business Program of Morehead State

17 University. My experience also includes employment as an Economist at the

18 Federal Highway Administration, as a consultant at Foster Associates, Inc., and

19 as a Senior Economist at Ashland Inc. I joined the Research Department of the

20 Public Service Commission in October of 1990.

21 **Q   What is the purpose of your testimony?**

22 A   The purpose of my testimony is to determine the cost of equity or

23 return-on-equity appropriate for United Utility Companies, Inc. (United Utility).

1   I will also determine the overall cost of capital for United Utility based on its

2   cost of debt and my estimate of its appropriate cost of equity.

3 **Q   What methodology was used to develop an estimate of United**

4 **Utility's cost of capital?**

5 **A**   Three components are necessary to estimate the cost of capital: the

6   capital structure, the cost of equity or return-on-equity, and the cost of debt.

7   Utilities, Inc., the parent company of United Utility, provided its cost of debt

8   which was verified by the Audit Department of the Public Service Commission.

9   The Discounted Cash Flow Model (DCF), the Capital Asset Pricing Model

10   (CAPM), and Risk Premium were used to estimate the cost of equity or return-

11   on-equity appropriate for United Utility. The appropriate capital structure was

12   determined through analyses of Utilities, Inc.'s capital structure and the capital

13   structures of a sample group of water and wastewater companies.

14 **Q   How did you estimate the cost of equity or return-on-equity for**

15 **United Utility?**

16 **A**   As previously stated, I applied the DCF, CAPM, and Risk Premium

17   analyses. Each of these methods is widely used and accepted in rate-making

18   proceedings as conforming to the requirements of the Hope and Bluefield

19   cases and is well documented in finance literature. Because neither United

20   Utility nor Utilities, Inc. is publicly traded, I applied the DCF and CAPM to a

21   group of water and wastewater companies for comparison purposes.

22 **Q   Which companies did you select for comparison, and how do they**

23 **compare to United Utility and Utilities, Inc.?**

1   **A**   The companies I selected for comparison purposes are American

2   States Water Company, American Water Works Company, California Water

3   Service Group, and Philadelphia Suburban Corporation. American States Water

4   Company is a holding company that, through subsidiaries, provides water

5   service to 1 out of 30 Californians located within 75 communities throughout

6   10 counties in California and 11,100 customers in Arizona. It also distributes

7   electricity to about 22,000 customers in California. American Water Works is

8   the nation's largest and most geographically diverse publicly-traded utility

9   devoted exclusively to water and wastewater businesses. Its subsidiaries serve

10   more than 10 million people in 1,300 communities in 23 states from coast-to-

11   coast. Through its subsidiaries, California Water Service Group provides

12   regulated and non-regulated water service to more than 2 million people in 96

13   communities in California, Washington, and New Mexico. Philadelphia

14   Suburban Corp. is a holding company for regulated public utilities that provide

15   water and wastewater services to approximately 2 million residents in

16   Pennsylvania, Ohio, Illinois, New Jersey, Maine, and North Carolina. These four

17   companies are the only publicly-traded water and wastewater companies

18   included in the Value Line Investment Survey.

19   Utilities, Inc. is a holding company that owns and operates 397 water

20   and wastewater utility systems through 76 subsidiary operating companies. It

21   serves about 235,000 customers in Florida, North Carolina, South Carolina,

22   Illinois, and Louisiana. The non-utility operations of Utilities, Inc. consist of a

1 solid waste collection billing service and management services. United Utility

2 serves 88 water and 1,402 sewer customers in upstate South Carolina.

3 Exhibit (JES-1) shows financial data for the comparison companies,

4 Utilities, Inc., and United Utility for the year 2000. Average operating revenues

5 for the comparison companies are nearly $514 million. Operating revenues are

6 approximately $65 million for Utilities, Inc., and $0.4 million for United Utility.

7 Average net income for the comparison companies is $62 million compared to

8 $10 million for Utilities, Inc. United Utility reported a loss of $64,000 in 2000.

9 The average net utility plant for the comparison companies is $1,886 million.

10 Net utility plant is $352 million for Utilities, Inc. and $2.8 million for United

11 Utility. Utilities, Inc.'s earnings per share of $1.58 exceeds the group average

12 of $1.48. The comparison companies pay approximately 67% of their earnings

13 in dividends while Utilities, Inc. and United Utility pay no dividends. The 14.4%

14 return-on-equity for Utilities, Inc. exceeds the 10.1% average return-on-equity

15 for the comparison companies and for each company. United Utility had a loss

16 in 2000 and, thus, had a negative return.

17 **Q Based on the Discounted Cash Flow (DCF) method, what is your**

18 **estimate of the cost of equity for United Utility?**

19 **A** The DCF methodology requires two components, a dividend yield and

20 an expected growth rate. For investors as a whole, the market value of

21 common stock is equal to the present value of the expected stream of future

22 dividends. Therefore, one must know the current dividend yield and its

23 expected growth in order to utilize the basic annual DCF model:

$$R_e = (D_1/P_0) + G$$

Where R_e = return on equity

D_1 = next annual dividend

P_0 = current market price of common stock

G = growth rate.

Assuming the market is efficient, the current dividend yield should reflect the best judgment of investors concerning the value of a stock. In essence, this assumption means that the current dividend (D_0) and the current market price (P_0) reflect the best estimates of the future of the company at the present time. This also allows for the current dividend (D_0) to be substituted for the next dividend (D_1) when utilizing the DCF model.

Since dividends are paid quarterly, the annual DCF model will understate the actual dividend yield if the dividend is increased during any of the four quarters comprising the annual model. Many analysts will use a quarterly DCF model instead of, or in addition to, the annual model. I have utilized the most liberal form of quarterly model in addition to the annual model. The quarterly model that I utilized, shown below, has dividends increasing quarterly instead of only once during the year. Such quarterly compounding will actually overstate the expected return.

$$K_e = [\, d_q(1+g)^{0.25}/P_0 + (1+g)^{0.25} \,]^4 - 1$$

Where: K_e = return on equity

d_q = current quarterly dividend

g = annual growth rate

1   P_0 = current market price

2   Exhibit (JES-2) shows the dividend yields for each comparison

3   company based on the January 15, 2001 dividend, the October-December

4   2001 end-of-month average stock price, and the January 15, 2001 stock price.

5   The average dividend yield based on the October-December 2001 end-of-

6   month average price is 3.11% compared to an average dividend yield of

7   3.20% when using the January 15, 2001 stock price. Dividend yields vary for

8   the individual companies from a low of 1.96% to a high of 4.55%.

9   Exhibit (JES-3) shows projected growth rates for water and wastewater

10 comparison companies. Both dividend growth and earnings growth have been

11 utilized in the DCF analyses. Although the DCF model is predicated on dividend

12 growth, there is disagreement concerning whether dividend growth rates or

13 earnings growth rates are reflective of investor expectations. Over the long

14 term, dividends cannot grow faster than earnings. Thus, earnings growth will

15 place an upper limit on dividend growth in the long run. Dividend growth rates

16 that are below earnings growth rates place a floor on investor expectations.

17 The results using dividend growth provide a floor on the return-on-equity

18 expectations while the results using earnings growth produce a ceiling on the

19 return-on-equity expectations.

20   Two public sources of growth forecasts have been utilized. The Value

21 Line Investment Survey is widely distributed and readily available to many

22 investors either by subscription or at libraries. Quicken forecasts are provided

23 by Zacks Investment Research, Inc. and are a composite of the forecasts of

1   many analysts. It is available at no cost to anyone having access to the

2   Internet. Growth forecasts published by Zacks can also be found in libraries.

3   Ideally, a very long-term growth is desired as the theoretical DCF

4   model values stock over its lifetime, and utility stocks have historically been

5   considered safe income stocks which investors have tended to hold for long

6   periods. However, investors usually do not have published sources for very

7   long-term forecasts and often buy and sell stocks over a period of a few years.

8   Therefore, it is not unreasonable to expect that investors would rely on five-

9   year growth forecasts when evaluating a stock.

10   It is apparent from the forecasts that the investment community does

11   not expect dividend growth to keep pace with earnings growth. The average

12   dividend growth rate for the comparison companies is 3.1% with a range of

13   1.5% to 5.0%. The average projected earnings growth rates for the

14   comparison companies are 7.3% by Value Line, and 6.6% by Quicken (Zacks)

15   with a range from 6.0% to 9.0%.

16   Exhibit (JES-4) shows the return-on-equity estimates using the annual

17   DCF model, and Exhibit (JES-5) shows the expected return-on-equity using the

18   quarterly DCF model. Based on dividend growth, the average expected return-

19   on-equity ranges between 6.32% and 6.42% using the annual model and

20   between 6.36% and 6.46% using the quarterly model. Returns-on-equity

21   based on dividend growth for the individual companies range from 5.61% to

22   7.58%. Based on earnings growth, the average expected returns-on-equity

23   range from 8.83% to 10.68% using the annual model and from 8.87% to

1   10.72% using the quarterly model. For the individual companies the returns-

2   on-equity based on earnings growth range from 7.68% to 11.62%.

3   The return-on-equity estimates derived using dividend growth provide

4   only about a 1 to 1.5 percentage point premium over long-term government

5   bond yields. Since the claims of stock holders are subordinate to the claims of

6   debt holders, the cost of equity must exceed the cost of debt. A 1 to 1.5

7   percentage point premium for the cost of equity would not be sufficient to

8   attract capital. Thus, the return-on-equity estimates based on dividend growth

9   must be discounted. Returns-on-equity in the 8.83% to 10.72% range derived

10   using earnings growth provide an equity premium in the 3.5 to 5.5 percentage

11   point range. Such a range is more in line with my Risk Premium analyses

12   discussed later.

13   **Q   Based on the Capital Asset Pricing Model (CAPM), what is your**

14   **estimate of the cost of equity for United Utility?**

15   **A**   The CAPM is a comparable earnings approach where all of the

16   nondiversifiable (systematic) market risk of a firm which impacts the risk

17   premium is determined relative to the entire market through the beta

18   coefficient. It establishes rate of return estimates in conjunction with the risk-

19   return relationship of the entire market. The return estimates derived through

20   the CAPM are equal to the opportunity costs of an investment in a particular

21   firm and, therefore, are the returns investors would expect from investment in

22   a firm of comparable risk.

1   None of the components of the Capital Asset Pricing Model, shown

2   below, can be observed directly.

3    $$R_e = B(R_m - R_f) + R_f$$

4   Where: R_e = return on equity

5   B = beta coefficient

6   R_m = market rate of return

7   R_f = risk-free rate of return

8   Theoretically, the beta coefficient (B), the market rate of return (R_m), and the

9   risk-free rate of return (R_f) should reflect values expected over the life of the

10   investment. Investors must rely on historical data and their best estimates of

11   future conditions to determine the value of the components of the CAPM.

12   Exhibit (JES-6) shows the betas for the past sixty-month period for the

13   comparison companies as reported by Value Line. Value Line betas are based

14   on the New York Stock Exchange Composite Index and are rounded to 0.00 or

15   0.05. Although these betas are not technically forecasts of future betas, they

16   are related to future expectations. Since investors make decisions based on

17   future expectations, the historical betas reflect the response of the market to

18   the future expectations of the investors during the previous sixty months. The

19   average value of the Value Line betas for the comparison companies is 0.60

20   with a range from 0.55 to 0.65. Given that the market as a whole has a beta

21   of 1.00, the values of the water and wastewater company betas indicate that

22   the nondiversifiable risk faced by these companies is less than that of the

23   market.

1   Determining the appropriate rate of return for the market may be the

2   most challenging component of the CAPM. According to Ibbotson Associates,

3   in Stocks, Bonds, Bills, and Inflation 2001 Yearbook, the geometric mean total

4   annual return on large company stocks was 11.0% for the 1926-2000 period.

5   The corresponding arithmetic mean return was 13.0%. The Research

6   Department of the Public Service Commission has calculated a 12.4%

7   geometric mean total return for the Standard & Poor's 500 Index for the 30-

8   year period 1970-2000, and a 14.4% arithmetic mean annual return. Over the

9   past 10 years, the growth in the Standard & Poor's 500 index has been

10   substantially higher than the 30-year growth. The geometric mean for the

11   1990-2000 period, as calculated by the Research Department, was 15.8% with

12   an arithmetic mean of 17.8%. Some investors may consider the more recent

13   past indicative of the future and might consider a market return of up to 18%

14   to be reasonable. However, the current recession may have lessened the long-

15   term market expectations of these investors. I would consider a market return

16   more reflective of the long-term historical returns to be more sustainable over

17   the long-term than the high market returns of the recent expansionary period.

18   Therefore, I have used market returns ranging from 11.0% to 14.4% in my

19   CAPM analyses.

20   U.S. government securities are generally considered to be the best

21   proxy for the risk-free rate of return. Given the taxing power of the Federal

22   government, there is minimal risk of default on these securities. Many U.S.

23   government securities are subject to inflation risk. However, the Federal

1   government does offer inflation-adjusted long-term savings bonds. Exhibit

2   (JES-7) shows the yields on U.S. government securities as of January 15, 2002

3   and an end-of-month average for the October-November 2001 period.

4   Historically, the 30-year Treasury Bond was considered the benchmark. The

5   federal government's aggressive effort to shrink its long-term debt in 2000

6   reduced the supply of 30-year bonds available, and the 10-year Treasury Bond

7   replaced the 30-year bond as the benchmark. Yields on Treasury Bonds have

8   generally been increasing as the Federal Reserve has lowered the discount

9   rate in an attempt to stimulate the economy. Federal Reserve Chairman

10   Greenspan has indicated that more reductions in the discount rate may be

11   forthcoming. However, the current discount rate of 1.25% leaves little room

12   for further reductions. I have used the January 15, 2002 yield of 4.83% on 10-

13   year Treasury Bonds and 5.33% on 30-year Treasury Bonds in my CAPM

14   analyses.

15   Exhibit (JES-8) shows the results of the CAPM analyses using the

16   historical long-term market returns as calculated by Ibbotson Associates and

17   the Research Department and the January 15, 2002 yields on 10-year and 30-

18   year Treasury Bonds as the risk-free rates. The average expected return-on-

19   equity for the comparison companies ranges from 8.53% to 10.77%. For the

20   individual companies, the range is from 8.22% to 11.23%. Based on the

21   CAPM, a cost of equity in the broad range of approximately 8.50% to 11.00%

22   would be reasonable.

PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA
101 Executive Center Drive, Columbia SC 29210
Post Office Drawer

11

1 **Q   Based on the Risk Premium analysis, what is your estimate of the**

2 **cost of equity for United Utility?**

3 **A**   The Risk Premium model is based on the theory that common

4 stockholders require a premium above the cost of debt to compensate them

5 for the added risk of being subordinate to debt holders on claims on a

6 companies earnings or assets. I have determined the risk premium based on

7 the yields on long-term government bonds. These yields are easily available to

8 the public.

9   Exhibit (JES-9) shows the risk premiums using 1926-2000 market

10 returns and long-term government bond yields as reported by Ibbotson

11 Associates in Stocks, Bonds, Bills, and Inflation 2001 Yearbook and 1970-2000

12 market returns of the S & P Utility Index and long-term government bond

13 yields as calculated by the Research Department from Standard & Poor's

14 Statistical Service. The equity risk premiums based on the total return on large

15 company stocks reported by Ibbotson are adjusted to reflect the fact that the

16 water and wastewater companies have less risk than the market. I used the

17 average beta of the water and wastewater companies to make this

18 adjustment. No adjustment was made to the equity premium based on the S &

19 P Utility Index since this index represents the return on utility stocks. However,

20 this premium probably overstates the actual risk premium applicable to water

21 and wastewater companies because the water companies tend to have lower

22 betas than telecommunications companies, or gas companies, and only slightly

23 higher betas than electric companies. The utility risk premiums range from

1   4.4% to 6.3%. Adding the risk premiums to the January 15, 2002 long-term

2   Treasury Bond yields of 4.83% and 5.33% produces a cost of equity ranging

3   from 9.23% to 11.63%. The cost of equity determined by the risk premium

4   analysis is consistent with the cost of equity determined by the DCF and CAPM

5   analyses.

6 **Q   Can or should the fairly wide ranges in the estimated cost of equity**

7 **be narrowed?**

8 **A**   If the estimates of cost of equity are to be useful for making decisions,

9   I believe that the ranges should be narrowed as much as possible.

10   Unfortunately, narrowing the range of estimates becomes somewhat

11   subjective, and depends on the analyst's interpretation of the impact of many

12   factors on the cost of capital. The following table shows the return-on-equity

13   ranges produced by the DCF, CAPM, and Risk Premium analyses:

Method	Return-on-equity (%)
DCF	8.83 – 10.72
CAPM	8.53 – 10.77
Risk Premium	9.23 – 11.63

18   Note that I have excluded the expected returns-on-equity generated by the

19   DCF analysis based on dividend growth because these returns did not provide

20   a sufficient premium over the cost of debt.

21   The DCF and CAPM expected returns-on-equity overlap between

22   8.83% and 10.72%. Overlap occurs in the DCF and Risk Premium analyses

23   between 9.23% and 10.72%. The CAPM and Risk Premium analyses overlap

1   between 9.23% and 10.77%. Each   methodology generates an expected

2   return-on-equity of up to 10.72%. Two of the methodologies produce an

3   expected return-on-equity of up to 10.77%. On an individual company basis,

4   the highest estimated return-on-equity is 11.62%. Based on the consistencies

5   of the methodologies, I would be confident that the return-on-equity for the

6   water and wastewater industry would be in the general range of approximately

7   9.25% to 11.00%.

8   Determining the return-on-equity applicable to United Utility or Utilities,

9   Inc. becomes more difficult. United Utility and Utilities, Inc. are much smaller

10   than the comparison water and wastewater companies. If all other factors are

11   identical, smaller companies generally are considered to have more risk than

12   larger companies. This higher risk is attributable to a smaller company's

13   limited access to financial resources should its financial position deteriorate.

14   Also, the loss of a customer, particularly a large customer, may have a greater

15   negative impact on a smaller company than a larger company. United Utility

16   depends on its parent, Utilities, Inc., for its external financing. As a regulated

17   utility, United Utility applies to the Public Service Commission for rate relief

18   when revenues are insufficient. Also, since the customers of United Utility are

19   primarily residential, the negative impact of losing a customer is fairly small.

20   Therefore, I believe that the risk of United Utility would be viewed by

21   an investor as reflective of the risk of its parent, Utilities, Inc. With most of its

22   revenues derived from regulated operations, Utilities, Inc. should have a risk

23   similar to that of other regulated water and wastewater companies that

1   comprise numerous geographically-dispersed operating affiliates, regardless of

2   size. The regulatory climate in its operating states is as important of a risk

3   factor as size. I have no knowledge that the regulatory climate in the states

4   where Utilities, Inc. has operating subsidiaries is any better or worse than the

5   regulatory climate in the states where the comparison companies operate.

6   However, because size can impact risk, I consider the upper end of my

7   narrowed range more appropriate. Thus, a return-on-equity or cost of equity

8   of 10.00% to 11.00% would be appropriate.

9   **Q   What did you determine was the appropriate cost of debt?**

10   **A**   In its application, United Utility proposed a cost of debt of 8.62%

11   which is the cost of debt for Utilities, Inc. The Audit Department has verified

12   this number. Because Utilities, Inc. provides all external financing for United

13   Utility, it is appropriate to use the 8.62% embedded cost of debt for Utilities,

14   Inc. in calculating the cost of capital for United Utility.

15   **Q   What is the appropriate capital structure?**

16   **A**   United Utility has proposed using the capital structure of its parent,

17   Utilities, Inc. Because Utilities, Inc., for all practical purposes, determines the

18   capital structure of United Utility, it is appropriate to use the capital structure

19   of Utilities, Inc., unless it deviates substantially from the industry capital

20   structure. Exhibit (JES-10) shows the actual capital structures of the

21   comparison companies and their projected capital structures for 2004-2006.

22   The average capital structure on December 31, 2000 for the group was 51.3%

23   long-term debt and 48.0% common equity. The average projected capital

1   structure consists of 53.3% long-term debt and 46.5% common equity. On

2   December 31, 2000 the capital structure of Utilities, Inc. was 50.0% long-term

3   debt and 50.0% common equity. The capital structure of Utilities, Inc. does

4   not differ substantially from that of the comparison companies. I used the

5   capital structure of Utilities, Inc. in my calculation of the cost of capital.

6   **Q.   What did you determine was the appropriate cost of capital for United**

7   **Utility Companies, Inc.?**

8   **A**   As shown in Exhibit (JES-11), the appropriate cost of capital for United

9   Utility Companies, Inc. is in the range of 9.31% to 9.81%.

10   **Q   Does this conclude your testimony?**

11   **A**   Yes.

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Application of <u>United Utility Companies, Inc.</u> for approval of a new schedule of rates and charges for water and sewer service in its certificated service areas in South Carolina.

Docket No. 2000-210-W/S

Exhibits of
James E. Spearman
Research Department

WATER AND WASTEWATER INDUSTRY
2000 OPERATING AND FINANCIAL DATA

Company	S&P Stock Rating	Return on Equity (%)	Operating Revenues ($ million)	Net Income ($ million)	Net Utility Plant ($ million)	Earnings Per Share ($)	Dividends Per Share ($)	Dividend Payout Ratio (%)	Customers
American States Water Co.	B+	9.3	184.0	18.0	509.1	1.92	1.29	67.2	NA
American Water Works Co.	A	9.4	1,350.6	161.1	5,202.8	1.61	0.90	55.9	2,580,968
California Water Service Group	B+	10.1	244.8	20.0	582.0	1.31	1.10	84.0	544,200
Philadelphia Suburban Corp.	A-	11.7	275.5	50.7	1,251.4	0.78	0.47	60.3	579,219
Average		10.1	513.7	62.5	1,886.3	1.41	0.94	66.8	1,234,796
Utilities, Inc.		14.4	64.7	10.1	351.8	1.58	0.00	0.0	235,000
United Utility Companies, Inc.	NA	0.4	-0.1	2.8	NA	0.00	0.0	1,490	

Sources: Company Annual Reports, SEC Form 10K, and Reports of Independent Public Accountants
  United Utility Companies, Inc. Application and responses to data requests and interrogatories
  Value Line Investment Survey, Nov. 2, 2001
  Standard & Poor's Stock Guide, Dec. 2001

WATER AND WASTEWATER COMPANIES
DIVIDEND YIELDS

Company	Oct.-Dec. 2001 end-of-month average stock price	Jan. 15, 2002 stock price	Jan. 15, 2002 dividend	Oct.-Dec. 2001 end-of-month average dividend yield	Jan. 15, 2002 dividend yield
American States Water Co.	$34.61	$36.70	$1.30	3.76%	3.54%
American Water Works Co.	$41.20	$42.86	$0.98	2.38%	2.29%
California Water Service Group	$25.84	$24.64	$1.12	4.33%	4.55%
Philadelphia Suburban Corp.	$27.01	$21.80	$0.53	1.96%	2.43%
Average	$32.17	$31.50	$0.98	3.11%	3.20%

Source: The Wall Street Journal

WATER AND WASTEWATER INDUSTRY
PROJECTED GROWTH RATES

Company	5-Year Projected Dividend Growth (%) Value Line	5-Year Projected Earnings Growth (%) Value Line	5-Year Projected Earnings Growth (%) Quicken (Zacks)
American States Water Co.	2.0	6.5	NA
American Water Works Co.	4.0	9.0	6.2
California Water Service Group	1.5	6.0	6.0
Philadelphia Suburban Corp.	5.0	7.5	7.7
Average	3.1	7.3	6.6

Sources: Value Line Investment Survey, Nov. 2, 2001
Average growth rate of analysts as of January 17 reported by Quicken
Zacks Investment Research Inc., Analyst Watch, May 31, 2001, Sep. 30, 2001.

WATER AND WASTEWATER INDUSTRY
ANNUAL DISCOUNTED CASH FLOW MODEL RETURN-ON-EQUITY

COMPANY	Oct.-Dec. 2001 Dividend Yield (%)	Jan. 15, 2002 Dividend Yield (%)	Value Line DPS Growth (%)	Oct.-Dec. 2001 Annual DCF Model ROE (%)	Jan. 15, 2002 Annual DCF Model ROE (%)
American States Water Co.	3.76	3.54	2.0	5.84	5.61
American Water Works Co.	2.38	2.29	4.0	6.48	6.38
California Water Service Group	4.33	4.55	1.5	5.89	6.12
Philadelphia Suburban Corp.	1.96	2.43	5.0	7.06	7.55
Average	3.11	3.20	3.1	6.32	6.42

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WATER AND WASTEWATER INDUSTRY
ANNUAL DISCOUNTED CASH FLOW MODEL RETURN-ON-EQUITY

COMPANY	Oct.-Dec. 2001 Dividend Yield (%)	Jan. 15, 2002 Dividend Yield (%)	Value Line EPS Growth (%)	Oct.-Dec. 2001 Annual DCF Model ROE (%)	Jan. 15, 2002 Annual DCF Model ROE (%)	Quicken (Zacks) EPS Growth (%)	Oct.-Dec. 2001 Annual DCF Model ROE (%)	Jan. 15, 2002 Annual DCF Model ROE (%)
American States Water Co.	3.76	3.54	6.5	10.50	10.27	4.0	7.91	7.68
American Water Works Co.	2.38	2.29	9.0	11.59	11.50	6.0	8.52	8.43
California Water Service Group	4.33	4.55	6.0	10.59	10.82	6.0	10.59	10.82
Philadelphia Suburban Corp.	1.96	2.43	7.5	9.61	10.11	6.2	8.28	8.78
Average	3.11	3.20	7.3	10.57	10.68	5.6	8.83	8.93

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WATER AND WASTEWATER COMPANIES
QUARTERLY DISCOUNTED CASH FLOW MODEL RETURN-ON-EQUITY

Company	Dividend Per Share Growth Value Line (%)	Earnings Per Share Growth	
		Value Line (%)	Quicken (Zacks) (%)
American States Water Co.	5.89	10.56	7.96
American Water Works Co.	6.50	11.62	8.54
California Water Service Group	5.97	10.67	10.67
Philadelphia Suburban Corp.	7.08	9.62	8.30
Average	6.36	10.62	8.87

Note: market price = average end-of-month price for Oct.-Dec. 2001

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WATER AND WASTEWATER COMPANIES
QUARTERLY DISCOUNTED CASH FLOW MODEL RETURN-ON-EQUITY

Company	Dividend Per Share Growth Value Line (%)	Earnings Per Share Growth	
		Value Line (%)	Quicken (Zacks) (%)
American States Water Co.	5.66	10.32	7.73
American Water Works Co.	6.40	11.51	8.44
California Water Service Group	6.19	10.90	10.90
Philadelphia Suburban Corp.	7.58	10.14	8.81
Average	6.46	10.72	8.97

Note: market price = January 15, 2002 closing price

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WATER AND WASTEWATER INDUSTRY
BETAS

Company	Value Line beta
American States Water Company	0.65
American Water Works Company	0.55
California Water Service Group	0.65
Philadelphia Suburban Corporation	0.55
Average	0.60

Source: Value Line Investment Survey, Nov. 2, 2001

U.S. Government Security Yields

Term	Security	Oct.-Dec. 2001 End-of-Month Average Yield	Jan. 15, 2002 Yield
10-Year	Treasury Bond	4.67%	4.83%
30-Year	Treasury Bond	5.20%	5.33%

Source: Wall Street Journal.

WATER AND WASTEWATER INDUSTRY
CAPITAL ASSET PRICING MODEL RETURN-ON-EQUITY

Company	Value Line Beta (B)	Market Rate of Return (Rm)	Risk-Free Rate of Return (Rf)	Expected Return on Equity (%)
American States Water Co.	0.65	11.0	4.83	8.84
American Water Works Co.	0.55	11.0	4.83	8.22
California Water Service Group	0.65	11.0	4.83	8.84
Philadelphia Suburban Corp.	0.55	11.0	4.83	8.22
Average	0.60	11.0	4.83	8.53

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WATER AND WASTEWATER INDUSTRY
CAPITAL ASSET PRICING MODEL RETURN-ON-EQUITY

Company	Value Line Beta (B)	Market Rate of Return (Rm)	Risk-Free Rate of Return (Rf)	Expected Return on Equity (%)
American States Water Co.	0.65	13.0	5.33	10.32
American Water Works Co.	0.55	13.0	5.33	9.55
California Water Service Group	0.65	13.0	5.33	10.32
Philadelphia Suburban Corp.	0.55	13.0	5.33	9.55
Average	0.60	13.0	5.33	9.93

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WATER AND WASTEWATER INDUSTRY
CAPITAL ASSET PRICING MODEL RETURN-ON-EQUITY

Company	Value Line Beta (B)	Market Rate of Return (Rm)	Risk-Free Rate of Return (Rf)	Expected Return on Equity (%)
American States Water Co.	0.65	12.4	4.83	9.75
American Water Works Co.	0.55	12.4	4.83	8.99
California Water Service Group	0.65	12.4	4.83	9.75
Philadelphia Suburban Corp.	0.55	12.4	4.83	8.99
Average	0.60	12.4	4.83	9.37

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WATER AND WASTEWATER INDUSTRY
CAPITAL ASSET PRICING MODEL RETURN-ON-EQUITY

Company	Value Line Beta (B)	Market Rate of Return (Rm)	Risk-Free Rate of Return (Rf)	Expected Return on Equity (%)
American States Water Co.	0.65	14.4	5.33	11.23
American Water Works Co.	0.55	14.4	5.33	10.32
California Water Service Group	0.65	14.4	5.33	11.23
Philadelphia Suburban Corp.	0.55	14.4	5.33	10.32
Average	0.60	14.4	5.33	10.77

EQUITY RISK PREMIUM

Ibbotson Associates (1926 - 2000)		Research Department (1970 - 2000)	
Total return on large company stocks	13.0%	Average return on S&P Utility Index	14.5%
Long-term government bond yield	5.7%	Long-term government bond yield	8.2%
Equity risk premium	7.3%	Equity risk premium	6.3%
Utility adjustment (beta)	0.60	Utility adjustment (beta)	NA
Utility equity premium	4.4%	Utility equity premium	6.3%

Sources: Ibbotson Associates, Stocks, Bonds, Bills, and Inflation 2001 Yearbook
Standard & Poor's, Statistical Service

WATER AND WASTEWATER INDUSTRY
CAPITAL STRUCTURE

Company	Actual 12/31/00			Projected 2004-2006		
	Long-term debt (%)	Preferred stock (%)	Common equity (%)	Long-term debt (%)	Preferred stock (%)	Common equity (%)
American States Water Co.	47.6	0.5	51.9	47.5	0.0	52.0
American Water Works Co.	56.9	1.3	41.8	58.0	1.0	41.0
California Water Service Group	48.0	0.9	51.1	56.0	0.0	44.0
Philadelphia Suburban Corp.	52.8	0.2	47.0	51.0	0.0	49.0
Average	51.3	0.7	48.0	53.1	0.2	46.5
Utilities, Inc.	50.0	0.0	50.0	NA	NA	NA

Sources: Company Annual Reports
Carolina Water Service, Inc. application
Value Line Investment Survey, Nov. 2, 2001

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COST OF CAPITAL

Long-term Debt (%)	Cost of Debt (%)	Common Equity (%)	Cost of Equity (%)	Cost of Capital (%)
50.02	8.62	49.98	10.00	9.31
50.02	8.62	49.98	11.00	9.81